DOCUMENT RESUME

ED 202 233 FL 012 307

AUTHOR Draizar, Andrea
TITLE Rapid Linguistic Change in Recovery from Aphasia.
PUB DATE 80
NOTE 17p.; Paper presented at the Annual Meeting of the Linguistic Society of America (San Antonio, TX, December 1980).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Aphasia; Intonation; Language Handicaps; Morphology (Languages); *Neurolinguistics; Nouns; *Speech Therapy; Syntax; Time Perspective; Verbs
IDENTIFIERS Anaphora; Boston Diagnostic Aphasia Examination

ABSTRACT

Changes in frequency of occurrence of the following linguistic variables in recovery from aphasia due to left temporal lobe lesions are analyzed in text and graphs: (1) quantity of verbalization, (2) syntactic structure: subject-verb-object vs. topic-comment, (3) syntactic complexity, (4) nouns and verbs, (5) morphology, (6) anaphora, and (7) intonation. Two groups of aphasics with left temporal lobe lesions were evaluated on the basis of a conversation and a picture description task. Each group was then placed into a different therapy program. The results illustrate the following: (1) The analysis of linguistic data collected from aphasics must take into account the issue of static vs. evolving language systems. Temporal studies encompassing periods of recovery are more accurate indicators of actual linguistic deficits. (2) Aphasics with temporal lobe lesions undergo a recovery process that tends to follow a pattern of increasing syntactization equivalent to the patterns of language acquisition in children and evolving systems such as pidgins into creoles. (3) a combination of sequencing training and the use of picture story sequences in aphasia language therapy is a more effective approach to remediation than more traditional techniques involving abstract drills and test questions. (Author/JK)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED202233

RAPID LINGUISTIC CHANGE IN RECOVERY FROM APHASIA

Andrea Draizar
Penn State Univ./ Baptist Hospital of Miami
Miami, Florida

Linguistic analyses of aphasic language behavior have traditionally been based on performances on abstract drills and test questions. The results have been utilized in arguments for and against theoretical issues: e.g. the reality of underlying forms in generative phonology, the existence of semantic association fields in the language retrieval system, and parallels between adult language pathology and language acquisition in children.

It is my contention that the static impression of aphasia obtained in such studies bears only a slight relationship to the actual deficits as observed during the recovery process. The changes observed in the re-emerging language system of aphasics have shown interesting parallels with other examples of language evolution. There are few time-based studies of the language of aphasia and recovery. However, even fewer studies have attempted to place controls on the data being collected.

This study concentrated on the changes in the frequency of occurrence of seven linguistic variables in recovery from aphasia due to left temporal lobe lesions. The temporal lobe is often likened to a 'switching station', where auditory and visual-verbal analysis and integration take place. Lesions in the left temporal lobe have been reported as disrupting various aspects of these processes, and most especially, of disturbing verbal sequencing skills.

FL 012 307

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Andrea Draizer
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Description of Study

Two groups of aphasic individuals with lesions affecting the left temporal lobe were evaluated on the basis of a conversation and a picture description task. The aphasics then participated in two different therapy programs.

The program of remediation used for the experimental group was based on the development of nonverbal sequencing skills and their carry-over into narrative descriptions of picture story sequences. The control group was given the same verbal and picture stimuli in random order, without the sequencing training.

The aphasics in the two groups were randomly chosen and did not differ significantly in baseline performance on the seven variables being observed using the Student-t test at .025 significance. However, the individual differences in language fluency varied due to the site and extent of the lesions. Anterior-temporal, fronto-temporal and larger temporal lobe lesions resulted in fairly non-fluent speakers. Whereas, individuals with smaller temporal lobe lesions, temporo-parietal or occipital lesions were more fluent. Therapy procedures were generally based on the Melodic Intonation Therapy techniques developed by Albert, Sparks and Helm at the Boston VA Hospital (1973). Individual variations were incorporated into the procedures to accommodate for differences in fluency and comprehension.

The participants were given the Boston Diagnostic Aphasia Examination (1972) as a more traditional means of determining the extent of disability and to complete the diagnostic picture. They were taped in the picture description task of the Boston and in spontaneous speech for a baseline of their use of the seven linguistic variables. The program of remediation began and after learning 7-10 picture story sequences ranging in length from 4-10 pictures, or the equivalent (42-60 sentences), the aphasic individuals were taped again using the same tasks as on the previous tape. The number of sentences (sequences) varied as it took

some individuals more stimuli to learn the routine of the procedures and some left the program early.

Variables

All of the syntactic variables observed on the tapes have been previously studied, in one form or another, as elements of change in aphasic verbal behavior.

1. Quantity of verbalization. Typically, mean sentence length and the number of transformations per sentence are defined as indicators of quantity of verbalization. They are the most cited variables in the aphasia literature. However, most of these studies have only used "grammatical" utterances. This is a serious restriction to place on data collection in aphasic output; especially because the changes from less grammatical to more grammatical utterances in recovery have not been studied. In this experiment, quantity of verbalization is defined as the total number of utterances. They are contrasted with the total number of 1-word utterances. (Figure 1) The control group started out with more total utterances than the experimental group. However, the rate of improvement over time was poor in comparison to the experimental group, who surpassed the controls in verbal output. Notice that the control group increased their single word output while there was no change in the experimental group. Therapy goals included increased length of utterance, therefore, the behavior of the experimental group was more desirable. The increase in verbal output of the control group was probably related to the increase in single-word utterances.

2. Syntactic Structure: SVO vs. TC. Most citations on word order have been in reference to the agrammatism so typical of aphasic language. Theories of agrammatic production tend to agree that stressed words of high relevance in the sentence

are the most consistently preserved. This would naturally lend itself to more topic-comment delivery that "normalizes" syntactically with recovery. Subject-Verb-Object word order is considered to be more syntacticized than topic-comment. (Figure 2) In English, the topic of the sentence is often the subject. For the purpose of this study, utterances were considered to be topic-comment only if they were clearly topics (e.g. left dislocation). This included single word utterances, phrases and ungrammatical utterances. On the graph, notice that the experimental group initially had depressed scores. This is congruent with the quantity of verbalization scores seen in Figure 1. Once again, observe the increment of change between the two groups as well as the difference in the frequency of SVO structures as opposed to TC structures.

3. Syntactic Complexity. Referred to in the literature by the number of transformations in grammatical utterances. Rather than count a controversial number of transformations, this study defines and observes conjoined vs. embedded structures as simple vs. complex.
(Figure 3) Observe the difference between the performances of the experimental and control groups. The number of expanded utterances increased in the experimental group. However, the complexity did not improve as dramatically. The control group's performance mean actually decreased in complexity.

4. N:V. It is generally felt that nouns are better preserved in aphasic language than verbs. In a recent study (1980), Berko-Gleason, et al. distinguished Wernicke's aphasics from Broca's aphasics by the fact that they had retained greater recall of verbs or nouns, respectively. The normal speakers used as controls in that study used nouns and verbs equally

in their speech samples. However, Givon (1979) cited research that claimed that normal, adult speakers use far greater nouns than verbs in spoken language behavior. (Figure 4) The data collected in this study were divided into three subsets: N V, N=V, N V. Looking at the results, notice that initially, the control group used more nouns than verbs per utterance. The experimental group utilized slightly more N=V structures. Despite that, after the therapy was administered, the experimental group surpassed the performance of the controls and increased the number of nouns per verb.

5. Morphology. It is well known that aphasics have difficulty with morphological processes. They leave off word endings and omit low content lexical items, among the more common behaviors. The correct and incorrect usage of morphological elements and their changes in recovery in both groups of aphasics are shown in Figure 5. Correct morphological use was prevalent initially in both groups, although to a greater degree in the experimental group. Curiously, the errors increased as well, whereas in the control group, the errors decreased---the more predictable pattern.

6. Anaphora. The inclusion of anaphoric elements in the study of linguistic deficits in aphasia is relatively recent. Berko-Gleason, et al (1980) was one of the first studies to observe the general impairments of omission or misuse of anaphora. Figure 6 shows the data collected from both the experimental and control groups of the study being reported on. The data reflect correct and incorrect use of anaphora. The experimental group showed a greater increase in use of anaphoric elements---both accurate and inaccurate, and the control group utilized anaphora less frequently and accurately.

7. Intonation. This variable has not been previously studied in aphasia language behavior other than the usual observations that intonation may be preserved when no other verbal skills are. Aphasics may perseverate on a one-word automatism yet exhibit full range of intonation---thereby succeeding in communicating many messages, however limited in content and concrete they may be. The perspective taken by this study is that intonation has an intricate connection with word order and sentence construction, reflecting the following dichotomy: one cohesive pattern accompanies tight, complex sentence structure (or one-word utterances), and looser, conjoined structures are spoken with several intonation contours. The data collected on this variable are deceptive. (Figure 7) The control group would appear to exhibit the expected pattern of change---an increase in the 1-intonation contour verbalizations and a decrease in the 1 intonation contour verbalizations. However, some of this can be attributed to the number of one-word utterances spoken by the control group. As previously shown in variable 1, the number of one-word utterances was greater in the control group than the experimental group. However, the experimental group did not do as well as expected. Both the 1 and 1 intonation contour verbalizations increased in use. The increase in 1 pattern utterances may be a reflection of the large number of conjoined phrase structures (variable 3). In any case, the relationship between intonation and sentence structure is more complex than initially expected.

The more general results of the study indicate that the experimental group surpassed the control group in their recovery of communicative function. By the end of the 7-10 weeks (not necessarily the termination of therapy), the aphasic individuals in the experimental group spoke more often, in more extended utterances, with more syntactic complexity, more lexical items

and greater use of morphological and anaphoric elements. From the speech/language clinician's perspective, this is powerful support for the stimuli and procedures used. Especially when we consider the raw data from one of the experimental group aphasics who did not receive any therapy for three months post-trauma. Three months are considered the time during which spontaneous recovery will occur if it is going to occur.

JH is a 59 year old man with post-high school vocational training. He suffered a cerebral vascular accident in the left temporo-parietal region three months prior to evaluation. He exhibitied the symptoms of a mild Wernicke's aphasic: 1) lack of awareness of deficits; 2) fair auditory comprehension; 3) fluent speech with word-finding difficulties characterized by jargon-type paraphasias and verbal-paraphasias; 4) poor visual language skills.

By the end of his participation in the program (7 story sequences), he had improved in all 4 areas of dysfunction---especially in self-awareness of errors, auditory comprehension and word-finding. The nature of his word-finding had changed to English verbal substitutes and self-correction. As can be seen from the data (last example on the hand-out), his N:V ratio improved to include more nouns and the syntactic complexity of his utterances increased to include more embeddings. The other variables remained essentially unchanged. However, his communicative skills had greatly improved.

The seven variables chosen for this study have been previously related to other forms of language evolution, such as pidgins into creoles and language acquisition in children. See Givon's book, <u>On Understanding Grammar</u> (1979), for more extensive background. The fact that recovery in temporal lobe aphasia generally follows a pattern of increased syntacticization similar to Givon's continuum of change implies that the universality of such processes transcends pathology.

Past attempts to equate language acquisition in children with language recovery in aphasics have failed. The studies concerned with pathological and evolving phonological processes were too

rigid; matching the phonological/phonetic inventories of children with normal brains and oral musculature to those of language impaired adults is not realistic. Especially considering the oral musculature weakness and incoordination that often accompany a stroke. Other studies have attempted to match the order of acquisition of syntactic structures with those of aphasics in the recovery process by assessing which structures they did not comprehend (in formal tests, not conversational data). This too is unrealistic. An aphasic is not the "tabula rosa", the blank slate of a child. Many of the syntactic structures have not been 'lost', implying the necessity to totally relearn them. The ability to retrieve and utilize the structures appropriately has.

Krashen (1980) and other second language acquisition scholars distinguish between the functional aspect of language acquisition and the formal aspect of language learning. According to Krashen, second language learners acquire structures in a fairly predictable order, but in a progression that involves variable usage as they are initially introduced and more rigid use as access to them is facilitated. It is more important to teach language acquisition than language learning in the ESL classroom---an important point that most clinical language instructors miss. Krashen suggests that context is one way to acquire the structures necessary for language acquisition. This is possible explanation for the differences between the two groups of aphasics observed in this study. The additional context of the stories often facilitated appropriate spontaneous recall of lexical items used more frequently by the aphasics than those supplied by the clinician. The stimuli were modified to incorporate these items and thus, facilitate further recall. The sequencing training within the context of stories depicting the activities of daily living provided a vehicle for the patients to work through cohesive semantic networks of lexical items and their appropriate use. The control group lacked the benefits of the vehicle and the cohesiveness of the stimuli.

When we look at the data from this study, Krashen's comments on the variability of usage in acquisition, a well-supported sociolinguistic concept, would help explain some of the unexpected results, such as in variable 3 (the increase in conjoined structures in the experimental group) and in variable 6 (the increase in incorrect use of anaphoric elements). This variability would be expected to decrease in time, a topic for future research.

Another relationship between language acquisition in children and language recovery in aphasia can be found in more global discourse structures. Schank and Abelson (1978) discuss the development of episodic memory in children as being the result of the association of objects with the events, or episodes in which they first occur. After several similar events occur, they become generalized into simple associations with accompanying sets of variations. In acquiring language, children develop scripts to accompany the episodes. Scripts, like episodes, generalize into major plans with variations. Miller, Gallanter and Pribram (1960) suggested that aphasic dysfunction might be a state of "planlessness". Aphasic verbalizations may be behavioral manifestations of different degrees of planlessness and of disruptions in certain plans while retaining the ability to access others that overlap in function or lexical association. This is supported by the variability of aphasic language performance. If this is the case, then the picture story sequences are ideal contexts in which to retrain or deblock the scripts and plans.

It is important to note that aphasia language therapy often takes over a year. Given the time involved in this study (approximately 7-10 weeks), the changes observed in the experimental group were dramatic.

One major point to be discussed is the underlying importance of temporal skills for cognition and language. Since language depends upon temporal phenomena, if a disruption in language accessing occurs (as in aphasia), then the appropriate temporal skills are disturbed. If non-verbal temporal skills can be used

as a trigger or catalyst to stimulate more appropriate temporally based language behavior and recovery, then that might also explain the results of the study.

The connection between increasing syntacticization from pidgins to creoles and aphasia recovery processes is an intriguing one. As Givon suggests and others have commented on, the communicative level at which brain damaged (aphasic) individuals operate is very concrete, concerned with the needs and events in the immediate temporal/spatial sphere. Regularity of syntactic form is lower priority than immediate communicative function. Pidgin languages are similar to aphasic language in these general attributes and they also exhibit similarities in syntactic behavior demonstrated by the seven variables used in this study. Syntactic structure is minimal and pragmatic function is intact.

As creole languages evolve from pidgins, all the processes of syntacticization occur, developing more regular, complex and abstract structures. The results of this study imply that aphasics follow the same tendencies in their re-emerging language systems.

The following are among the most important points made in this paper:

1. The analysis of linguistic data collected from aphasic individuals must take into account the issue of static vs. evolving language systems. Temporal studies encompassing periods of recovery from aphasia-producing trauma are more accurate indicators of the actual linguistic deficits. They are important for predictability of patterns of recovery, further arguments for or against localization, and contain implications for clinical procedures with language pathologies.
2. Aphasic individuals with temporal lobe lesions undergo a recovery process that tends to follow a pattern of increasing syntactization equivalent to the patterns of language acquisition in children and evolving language systems such as pidgins into creoles. This is based on the trends of all three on seven variables indicating increased syntactic complexity.

3. The combination of sequencing training and the use of picture story sequences in aphasia language therapy is a more effective approach to remediation than traditional techniques. The underlying causes can be related to the dependence of communication and cognition on sequencing skills and improved language acquisition utilizing contextual stimuli.

BIBLIOGRAPHY

1. Albert, M.L., R. Sparks and N. Helm. 1973. "Melodic Intonation Therapy for Aphasia." Archives of Neurology 29, 130-131.

2. Berko-Gleason, J., H. Goodglass, L. Obler, E. Green, M.R. Hyde, S. Weintraub. 1980. "Narrative Strategies of Aphasic and Normal Speaking Subjects." Journal of Speech and Hearing Research 23, 370-382.

3. Givon, Talmy. 1979. On Understanding Grammar. Academic Press, New York.

4. Goodglass, H. and Kaplan, E. 1972. The Assessment of Aphasia and Related Disorders. Lea and Febiger, Philadelphia.

5. Krashen, Stephen. 1980. "The Input Hypothesis." Paper presented at the 31st Georgetown University Round Table on Languages and Linguistics.

6. Miller, G., E. Gallanter and K. Pribram. 1960. Plans and the Structure of Behavior. Holt, New York.

7. Schank, R. and Abelson, R. 1977. Scripts, Plans, Goals and Understanding. John Wiley and Son, New York.

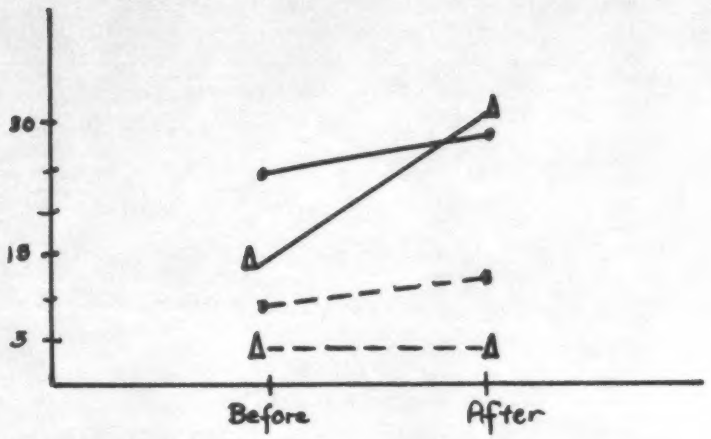

Figure 1. Quantity of Verbalization

Exp.
Δ—Δ Total utterances
Δ--Δ 1-word utterances

Control
Total utterances
1-word utterances

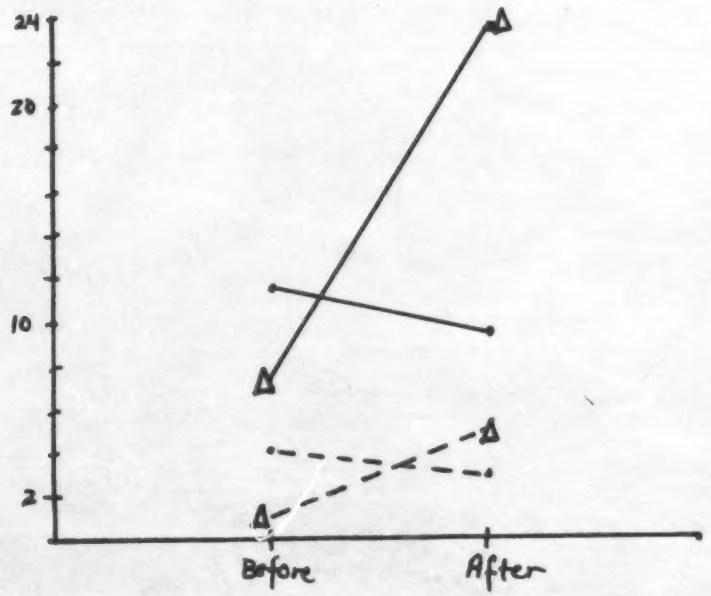

Figure 2. Syntactic Structure

Exp.
SVO
T-C

Control
SVO
T-C

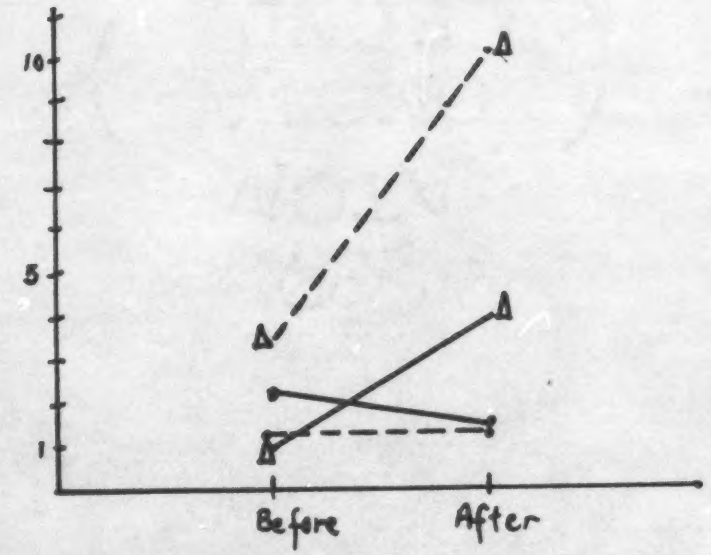

Figure 3. Syntactic Complexity

Exp.
subordination
concatenation (conjunction)

Control
subordination
concatenation

(1) ADraizar

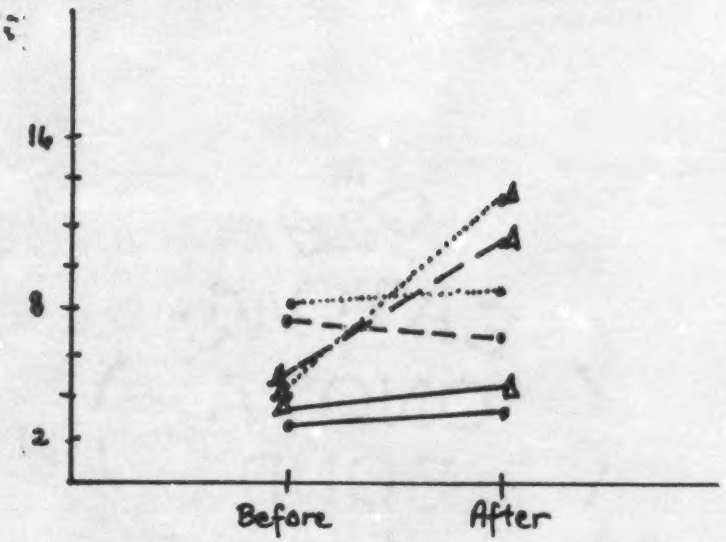

Figure 4. N:V

Exp.

N < V
N = V
N > V

Control

N < V
N = V
N > V

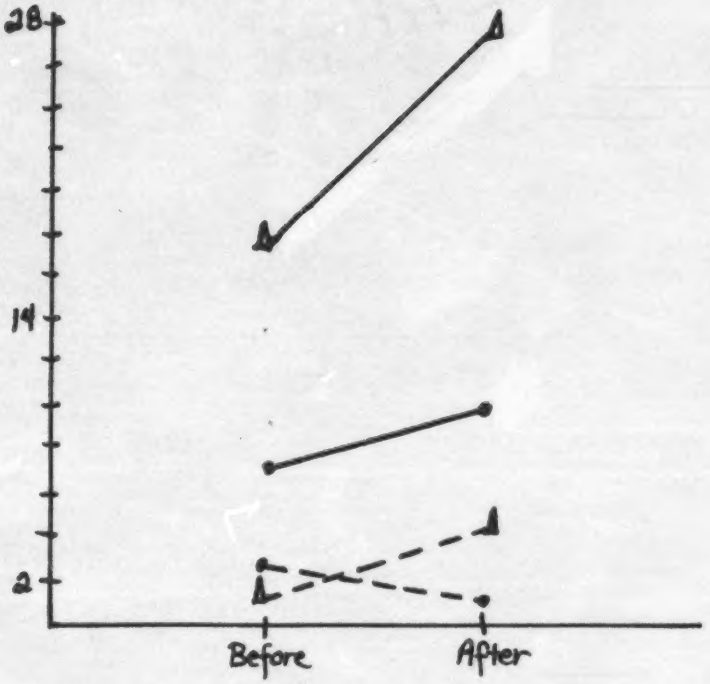

Figure 5. Morphology

Exp.

correct use
incorrect use

Control

correct
incorrect

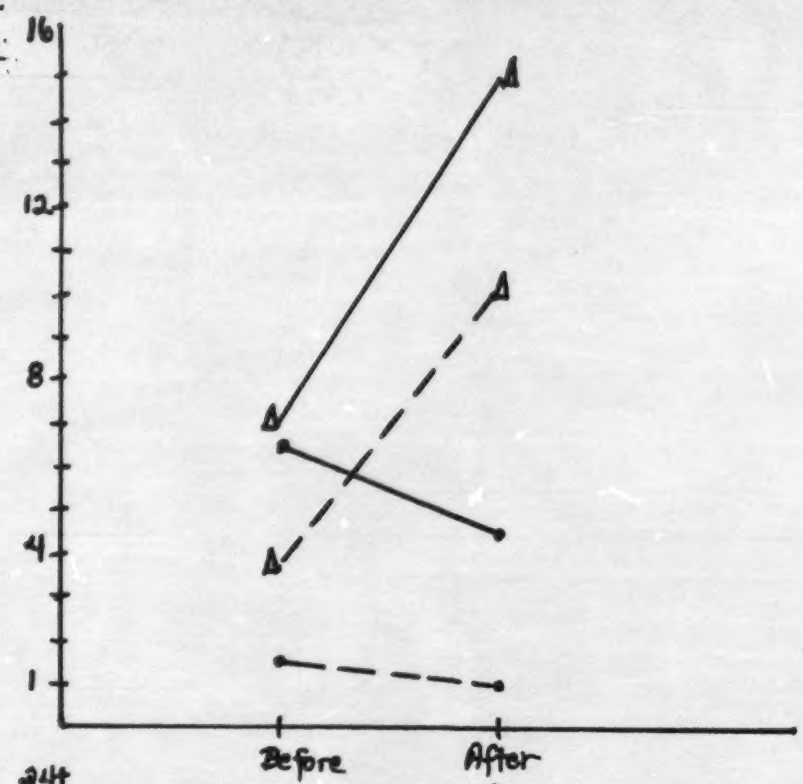

Figure 6. Anaphora

Exp.
correct use
incorrect use

Control
correct
incorrect

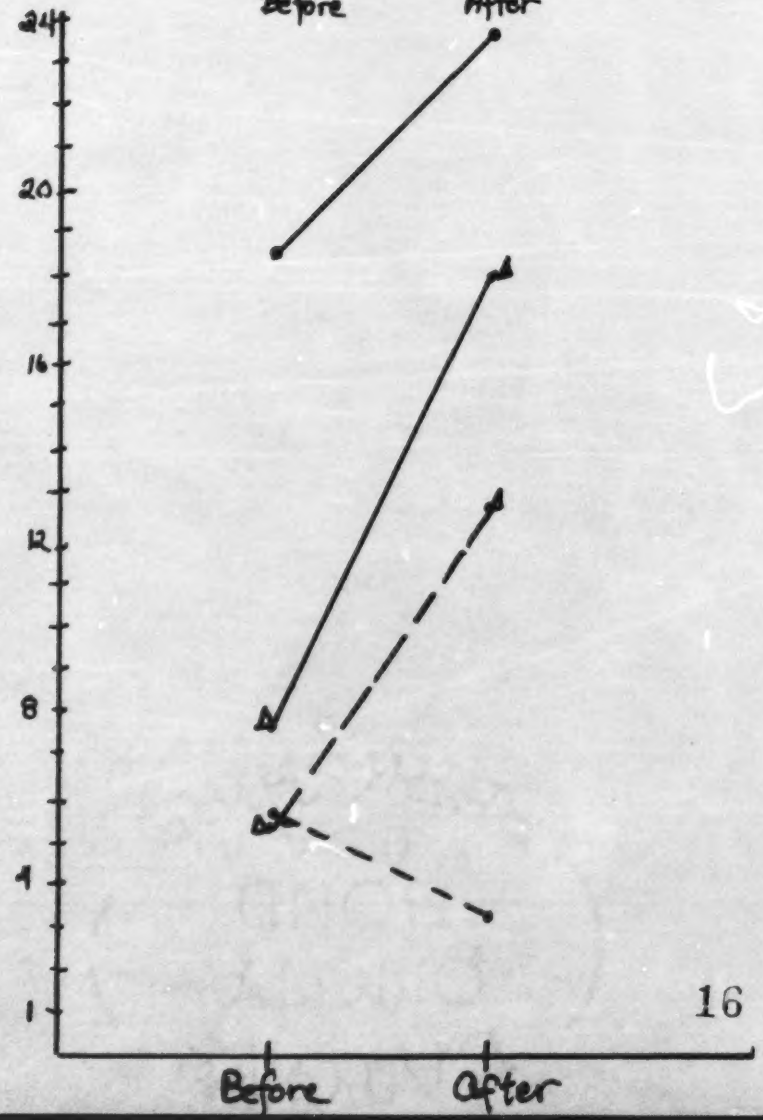

Figure 7. Intonation Contours

Exp.
1 per utterance
>1 per utterance

Control
1 per utterance
>1 per utterance

(3) ADrazar

JH: 56♂

		Before	After
Sub (Con)		2(8)	5(6)
N:V	N<V	4	5
	N=V	9	12
	N>V	3	10

(4) ADrai ear